WHAT IS CLAIMED IS:

1. An optical fiber including a core region and cladding regions of not less than three layers which surround said core region in order, wherein

at least one of said cladding regions has lower mean refractive index than both adjacent cladding regions, and at least one cladding region is provided with a plurality of sub medium regions each having a refractive index lower than a main medium constituting this cladding region.

2. An optical fiber according to claim 1, wherein said core region is constituted by a substantially homogeneous medium and said cladding regions are constituted by an inner cladding region of not less than two layers made of a substantially homogeneous medium and an outer cladding region surrounding said inner cladding region is provided with said sub medium regions.

3. An optical fiber according to claim 2, wherein said inner cladding region has a two-layer structure consisting of a first inner cladding region and a second inner cladding region and a following relationship holds among respective refractive indices n_0, n_1, n_2 of said core region, said first inner cladding region, said second inner cladding region and a mean refractive index n_3 of said outer cladding region.

$n_0 > n_2 > n_1$ and $n_2 > n_3$

4. An optical fiber according to claim 3, wherein

said sub medium regions in said outer cladding region are arranged as having a four-fold rotational symmetry.

5. An optical fiber according to claim 3, wherein said main medium of said outer cladding region is made of silica and said sub mediums are gaseous or vacuum.

6. An optical fiber according to claim 5, wherein the relative mean refractive index difference of said core region to said outer cladding region is set to not less than 2 %.

7. An optical fiber according to claim 5, wherein the relative mean refractive index difference of said first inner cladding region to said second inner cladding region is set to not more than -0.1 %.

8. An optical fiber according to claim 5, wherein the ratio of the optical power which propagates through said sub mediums of said outer cladding region to the total propagating power is set to not more than 1 %.

9. An optical fiber according to claim 3, wherein said optical fiber is operated in a single mode at a given wavelength.

10. An optical fiber according to claim 3, wherein the chromatic dispersion at a given wavelength is set to a value below -80 ps/nm/km.

11. An optical transmission path including said optical fiber according to claim 10 and an optical fiber having a positive chromatic dispersion at said given

wavelength.

12. An optical fiber according to claim 1, wherein said sub medium regions are arranged in a plurality of cladding regions and the cross-sectional area ratio of said sub medium regions in each cladding region differs from that in each adjacent cladding region.

13. An optical fiber according to claim 12, wherein the cross-sectional areas of said sub medium regions are made substantially uniform in each cladding region and different from the cross-sectional areas of sub-medium regions in each adjacent cladding region.

14. An optical fiber according to claim 12, wherein the arrangement of said sub medium regions is substantially made equivalent to a hexagonal lattice or square lattice.

15. An optical fiber according to claim 12, wherein said cladding region has a three-layer structure consisting of a first inner cladding region, a second inner cladding region and an outer cladding region and a following relationship holds among respective mean refractive indices n_0, n_1, n_2, n_3 of said core region, the first inner cladding region , the second inner cladding region and the outer cladding region.

$$n_0 > n_2 > n_1 \text{ and } n_2 > n_3$$